

CLAIMS

1. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties, said steel sheet containing, in mass,

5           C: 0.0050% or less,  
          Si: 0.50% or less,  
          Mn: 0.005 to 1.0%,  
          P:  $10x(B-11/14xN)$  to 0.10%,  
          S: 0.080% or less,  
10           Al: 0.050% or less,  
          N: 0.0005 to 0.020%,  
          B: 0.60xN to 0.020%,  
          O: 0.002 to 0.0800%, and  
and the balance being Fe and unavoidable impurities, and  
15           the steel sheet further containing simple or compound  
          nitrides having a diameter of 0.02 to 0.50  $\mu\text{m}$  which  
          contain B or Al, and having the average diameter of 0.080  
           $\mu\text{m}$  or larger, and the proportion of the number of the  
          nitrides of 0.050  $\mu\text{m}$  or smaller in diameter to the total  
20           number of said nitrides being 10% or less.

2. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties, said steel sheet containing, in mass,

25           C: 0.0025% or less,  
          Si: 0.050% or less,  
          Mn: 0.10 to 0.50%,  
          P:  $10x(B-11/14xN)$  to 0.030%,  
          S: 0.030% or less,  
          Al: 0.010% or less,  
30           N: 0.0035 to 0.0060%,  
          B: 0.60xN to 0.0060%,  
          O: 0.005 to 0.0450%, and  
and the balance being Fe and unavoidable impurities, and  
35           the steel sheet further containing simple or compound  
          nitrides having a diameter of 0.02 to 0.50  $\mu\text{m}$  which  
          contain B or Al, and having the average diameter of 0.080

$\mu\text{m}$  or larger, and the proportion of the number of the nitrides of  $0.050 \mu\text{m}$  or smaller in diameter to the total number of said nitrides being 10% or less.

5       3. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties, said steel sheet containing, in mass,

C: 0.0025% or less,

Si: 0.050% or less,

Mn: 0.10 to 0.50%,

10       P:  $10x(B-11/14xN)$  to 0.030%,

S: 0.030% or less,

Al: 0.010% or less,

N: 0.0005 to 0.0033%,

B:  $0.60xN$  to  $0.90xN\%$ ,

15       O: 0.005 to 0.0450%, and

and the balance being Fe and unavoidable impurities, and the steel sheet further containing simple or compound nitrides having a diameter of 0.02 to 0.50  $\mu\text{m}$  which contain B or Al, and having the average diameter of 0.080  $\mu\text{m}$  or larger, and the proportion of the number of the nitrides of  $0.050 \mu\text{m}$  or smaller in diameter to the total number of said nitrides being 10% or less.

4. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties according to any one of claims 1 to 3, wherein the steel sheet further containing one or more of Nb, V, 5 Ti, Ni, Cr, Se, As, Ta, W, Mo and Sn at 0.030 mass % or less in total.

5. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties according to any one of claims 1 to 4, said 10 steel sheet satisfying the following expression:

(the amount of N existing as BN)/(the amount of N existing as AlN)  $\geq$  10.0

6. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling 15 properties according to any one of claims 1 to 5, said steel sheet satisfying the following expression:

(the amount of N existing as BN)/(the amount of N existing as AlN)  $\geq$  0.50

7. (Amended) A method for producing a steel sheet 20 for vitreous enameling excellent in workability, aging properties and enameling properties and enameling properties characterized by:

25 retaining a slab containing the components according to any one of claims 1 to 4 in the temperature range from 900 to 1,100°C (Retained Temperature Range 1) for 300 minutes or longer before commencing hot rolling;

thereafter retaining it in a temperature range not less than 50°C higher than said retained temperature (Retained Temperature 2) for 10 to 30 30 minutes;

then cooling it to a temperature range not less than 50°C lower than said retained temperature (Retained Temperature 3) at a cooling rate of 2°C/sec. or less;

35 retaining it in said retained Temperature 3 for 10 minutes or longer; and thereafter commencing hot

rolling.

8. (Amended) A method for producing a steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties and enameling properties according to claim 7, wherein hot-rolling is controlled under the condition of the time period from the time when the coiling of a hot-rolled steel sheet terminates at a temperature of 700 to 750°C in a hot-rolling process to the time when the temperature of said steel sheet reaches 550°C or lower for 20 minutes or 5 longer.

9. (Amended) A method for producing a steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties and enameling properties according to claim 7 or 8, wherein the hot-  
5 rolled steel sheet is retained in the temperature range from 900 to 1,200°C for 2 minutes or longer with the temperature of said steel sheet not lowered to 900°C or lower when the reduction ratio reaches 50% or more after commencing hot-rolling, and thereafter hot-rolling is  
10 commenced again.